4. *Corbula* (*Azara*) *pyriformis*, Meek.
5. " " " var. *concentrica*, Meek.
6. " " *Engelmanni*, Meek.
7. *Cyrena* (*Corbicula*) *Durkeei*, Meek.

Shell attaining a moderately large size; subtrigonal in outline, thick and strong, gibbous in the central and umbonal regions, and cuneate postero-ventrally; posterior side sloping above, and narrowly rounded below; beaks rather elevated, pointed, and curving inward and forward, so as nearly to touch each other; posterior dorsal region much inflected from the beaks down the slope nearly to the extremity of the valves, so as to give the posterior umbonal slopes a prominently rounded appearance. Surface with moderately distinct marks of growth.

Very closely allied to *C. antiqua*, Ferr., and *C. Forbesi*, Desh., from Lignite Lower Eocene beds of the Paris Basin, but differs from both in the details of the hinge, its lateral teeth being nearly or quite smooth, and like the cardinal teeth, differing in other respects.

Named in honor of Mr. H. R. Durkee, who sent large collections of the species to the Smithsonian Institution, from Wyoming.

8. *Tiara humerosa*, Meek.

Elk Station, Cent. Pac. R. R., beyond Salt Lake.

9. *Sphærium* (two or more species, in highly bituminous shale).

Fort Bridger; Wyoming (McCarter).

Unio Haydeni, Meek.
Melania (*Goniobasis?*) *Simpsoni*, Meek.
Viviparus (two or more undt. species).
Planorbis spectabiles, Meek.
Cypris (undt.) In Oolitic? matrix.

DESCRIPTIONS OF FOSSIL FISHES, FROM THE UPPER COAL MEASURES OF NEBRASKA.

By Orestes St. John.

Read by Dr. F. V. Hayden, before the American Philosophical Society, May 6, 1870.

Genus CLADODUS, Agassiz.

Cladodus mortifer, N. and W.

Reference.—Newberry and Worthen, Geol. Illinois, Vol. II, p. 22; Pl. I, fig. 5.

In the collection there are fragments of three individuals of the above species—two showing the base with portions of the crown, and one preserving about a third of the lower portion of the median cusp of a very large specimen. There can be no doubt that the teeth before me are referable to the above species; but as they exhibit characters not shown in the imperfect specimen figured and described by Messrs. Newberry and Worthen, a short description of the Nebraska teeth is here appended.

Description.—The base of the tooth is semi-elliptical in outline, obtusely angular behind, with low protuberances rising at the angles upon the superior inner margin, the outer margin interrupted by a broad, shallow sinus, at either angle of which, immediately beneath the smaller lateral denticles, an obtuse node projects downward, similar to those upon the upper opposite side of the root, the presence of which would seem to have been designed to lend additional strength to the muscular attachment of the tooth upon its cartilaginous support; median cone cervical, regularly tapering, recurved, inequally compressed, with acute lateral edges; striæ sharp, interrupted, separated by wide plane spaces, less numerous upon the strongly compressed anterior face, and confined to the lower half of the cusp; lateral denticles two upon either side, strong, with sharp cutting edges, and strong sharp striæ or ridges.

Breadth of base twice its length, and equal to the entire height of the tooth.

This species, so far as we at present know, is restricted to the Upper Coal Measures. The single type specimen from which the species was originally described, was found in the Upper Coal strata near Springfield, Illinois; and in the prosecution of the geological survey of Iowa, Dr. White has brought to light the same species from the Upper Coal Measures of the southwestern portion of the State. I have also found this species in the same formation at Manhattan, Kansas.

Compared with other species, the present one is probably more closely related to *C. mirabilis*, Agassiz, from the mountain limestone, Ireland, than with any other with which I am acquainted. It differs, however, in being less robust, and more symmetrical in its general proportions.

Formation and Locality:—Upper Coal Measures, bed 6, Nebraska City section, Nebraska.

Genus DIPLODUS, Agassiz.

Diplodus compressus, Newb.

Reference.—Newberry, Geol. Illinois, Vol. II, p. 60; Pl. IV, fig. 2.

The single specimen *Diplodus* in the collection is probably referable to the form described by Dr. Newberry, under the name *D. compressus.*

Description.—The tooth is of medium size; base slightly narrower than long, broadly rounded in front, and terminating in an obtuse point behind, under surface slightly raised in the middle, anterior extremity produced into a large obtuse tubercle projecting slightly outward and downward, with a flattened, sharply defined, obovate pad-like projection upon the upper surface of the posterior extremity, marked upon either side by a shallow groove terminating above in a little pit, and which is entirely separated from the bases of the crown cusps,—in this latter respect, as Dr. Newberry has remarked, offering marked contrast to *D. gibbosus*, Agassiz, from the mountain limestone of Europe; cusps three, median one rudimentary, slender, compressed, with finely crenulated lateral edges, base well defined from the general surface and terminating in a slight protuberance in the osseous root in front; the apices of the lateral cusps

are broken away in the specimen before me; they are strongly compressed, smooth, with sharp, beautifully annulated cutting edges, unequally divergent; left one—viewed from before—most inclined from a vertical line and broadest at base; transverse section of both lenticular.

In the collection of the State Geological Survey there is a tooth from the Upper Coal Measures of southwestern Iowa, which is doubtless specifically identical with the Nebraska specimen, though possessing some slight differences. In the Iowa specimen the base has, as in the above described tooth, a lozenge-shaped outline, its posterior extremity is more abruptly truncated, and the pad-like elevation surmounting its surface is ellipitical with its longer axis transverse to the root—in other respects the same as the Nebraska tooth; viewed in front, the right lateral cone is the strongest and most inclined laterally, and the bases on the anterior face are swelled out, producing an angular ridge or buttress, which, however, is lost both in the crown above and in the root below. These two individuals are the only ones I have had opportunity to examine, and comparing them with the excellent description and figures of *D. latus*, Newb., I cannot doubt but that they are distinct from that species. The present species is described from the Coal Measures of Ohio and southwestern Indiana, the latter locality holding a stratigraphical position probably below the Nebraska horizon.

Form. and Loc.—Upper Coal Measures.

Genus PETALODUS, Agassiz.

Petalodus destructor, N. and W.

Reference.—Newberry and Worthen, Geol. Illinois, Vol. II, p. 35; Pl. II, figs. 1-3.

The collection contains a large, almost perfect specimen of the above species, which presents the following characters:

Description.—The crown is sharp, compressed, gradually thickening toward the base; crest more or less gently arched from the lateral extremities, obtusely acuminate at the apex, and distinctly striated for the space of a line or less, below which the striæ are lost in the dense enamel-like coating which covers both faces of the crown; posterior face of crown rhombic, outline of base similar to that of crest, and bordered by five strongly marked imbricating folds, which are conspicuously arched downwards in the middle and more or less deflected at the lateral extremities; anterior face broadly rhomboidal, basal fold consisting of four or five obscurely marked imbrications, gently curved downwards in the middle and again at the lateral extremities; the upper edges of the imbricating folds are minutely crenulated; root broad, compressed at the edges, rapidly tapering from the lateral shoulders, and terminating in a blunt rounded point. Upon much worn surfaces the crown is finely punctate.

	Inches.
Length, nearly	2
Greatest breadth of crown, about	1.60
Height of anterior face of crown	.95
Height of posterior face	1.28
Breadth of root across the lateral shoulders, about	1.1

This species bears a striking resemblance to *Petalodus acuminatus*, Agassiz, from the mountain limestone of Europe; but, at the same time, it possesses characters which readily distinguish it from that species. The present species differs mainly in the more tapering root, the coronal band upon the inner face is more strongly curved downwards in the middle, and the crown is relatively higher. This species was originally described from the Upper Coal Measures of central Illinois. I have seen a fine specimen of the same species in the collections of the Museum at Cambridge, from similar horizons in southwestern Indiana, and also from the Upper Coal Measures of central Iowa.

Form. and Loc.—Upper Coal Measures.

Genus PERIPRISTIS, Agassiz (MS).

Gen. char.—Teeth small or of medium size, possessing the general characteristics of the Petalodonts. Crown compressed, acuminate, serrate, more or less curved laterally; extremities on the inner face connected by a raised transverse shoulder, in which the crown terminates below and which gives rise to a more or less profound coronal cavity. Root well developed, entire, as in *Petalodus*. The surfaces of the crown and coronal cavity are covered by a dense and highly polished layer of ganoine, which forms an imbricated band at the base.

The above generic designation was suggested by Prof. Agassiz, for the reception of a group of peculiar teeth, of which we have at least two representative species—that of *P. semicircularis* being regarded as the type. These forms certainly possess features which are widely at variance to the typical species of the genus *Ctenoptychius*, as represented by *C. apicalis*, Agassiz; and in their description of the following species, Messrs. Newberry and Worthen have also referred to the remarkable characters which distinguish it from the typical species of *Ctenoptychius*. The central coronal cavity and the prominent transverse ridge in which the root is terminated above on the posterior aspect, are peculiarities which do not appear in any of the numerous other genera comprised in the groups of Petalodonts.

The genus is Carboniferous, ranging from the Subcarboniferous to the Upper Coal Measures inclusive.

Peripristis semicircularis.

Ref. and Syn.—*Ctenoptychius semicircularis*, Newberry and Worthen, Geol. Illinois, Vol. II, p. 72; Pl. IV, Figs. 18, 18a, 18b.

Description.—Tooth small, broadly obovate in outline, crown much compressed and strongly curved laterally, giving the crest a semicircular outline viewed from above; cutting edge divided into seven to nine denticulations, the median lobe strongest, lateral ones gradually decreasing in size toward the lateral extremities, where they are scarcely relieved from the edge; the calcigerous tubes slightly diverge on nearing the edge, producing a minute radiated striation of the denticulations like that observed in the even crest of *Petalodus*, and when the crown is much worn the surface is finely punctate; outer face of crown very low in proportion to

its breadth, base sharply beveled, coronal band narrow, imbrications very obscure or obsolete, gently descending in the middle and slightly curved downward at the lateral extremities; upon the posterior face the base of the crown is defined by a conspicuous transverse ridge, which unites the lateral extremities, and gives origin to a deep central coronal cavity; the enamel-like coating lines the walls of the cavity, and spreading over the gently and regularly downward arched transverse shoulder, it forms a thin coronal band with one or two faint imbrications upon its external inflexed border. The root is nearly as wide and much thicker than the crown, tapering rapidly and rounded at its extremity; anterior side convex or ridged, posterior face slightly concave transversely, both surfaces more or roughened.

	Inches.
Greatest length,	.77
Greatest breadth at the lateral angles of the crown,	.72
Height of crown upon its anterior face,	.32
Depth of the coronal cavity from the apex of the median denticulation, about	.45
And from the transverse shoulder, about	.20

The collection contains a perfect individual of the above described species, from Bellvue, Nebraska, imbedded in a matrix of limestone, but exhibiting the entire posterior aspect of the tooth without a blemish; and I owe to the kindness of Mr. J. Sterling Morton, of Nebraska City, another equally perfect specimen, obtained from a shaft excavation near the City, which shows the anterior face of the tooth. I think there can be no question as to their specific identity with the form described by Messrs. Newberry and Worthen, from the Upper Coal Measures of Illinois.

I am acquainted with but a single other form to which this species seems to be closely related, and that is from the mountain limestone of Yorkshire, England. Specimens of the latter species are in the extensive collections of the Museum of Comparative Zoölogy at Cambridge. The English specimens are, however, markedly specifically distinct from the American; they are less curved laterally, and possess some sharp, thick serrations on either side of the median cusp; the crown is relatively higher, and the coronal band on the outer face is more deeply arched downward in the middle, is wider and more distinctly imbricated; the coronal cavity of the inner face is shallower, and the transverse shoulder less prominent. I am not aware that the English species is described.

Form. and Loc.—Upper Coal Measures.

Genus CHOMATODUS, Agassiz.

Chomatodus arcuatus, n. sp.

A fragment of limestone from Bennet's mill, near Nebraska City, preserves the impression of a tooth of the genus Chomatodus, which seems to be distinct from all the species of this genus heretofore described from the Coal Measures and Subcarboniferous. The impression presents almost the entire figure of the anterior face, from which the following description is given:

Description.—Tooth large, laterally elongated, moderately thick (?), extremities rounded; crown slightly arching from the lateral angles and curved laterally, anterior face slightly convex vertically and rounded at the crest, which was probably more or less obtuse; the anterior face of the crown was apparently undulated along its crest, the obscure sulci may have reached half the distance from the crest toward the base, and at the median line a very shallow depression, about as high as it is wide at the base, reaches upward about two-thirds the height of the crown, and seem to interrupt the continuity of the basal folds, which, however, may not be persistent or of specific importance; basal band narrow, linear, with two or three imbricated folds, and parallel with the base of the root; surface coarsely punctate. Root nearly as wide as the crown, its anterior face deeply channeled by an angular transverse furrow, with a low ridge traversing the lower portion from one extremity to the other, below which it is beveled to the outer basal edge.

	Inches.
Greatest breadth, about	1.60
Height,	.50
Greatest height of anterior crown face,	.22

In outline the above species bears a somewhat marked resemblance to *C. loriformis*, N. and W., from the Keokuk limestone; but it differs from that form in having the anterior face of the crown relatively higher, its crest undulated and less parallel, and its bow-shaped outline viewed from above, as well as in the more vertical concavity of the outer aspect of the root. It is not improbable that the basal angle of the posterior crown face was quite prominent, and the vertical concavity of that face of the crown must have been considerable, judging from the arched character of the opposite face, and in this respect somewhat resembling *C. cinctus*, Agassiz, though the present species is not acuminate, the coronal band not nearly as wide as in that species, and the tooth is not as thick and massive.

Form. and Loc.—Upper Coal Measures, Bennet's mill, near Nebraska City.

Genus XYSTRODUS, Agassiz (ms.)

Xystrodus? occidentalis, n. sp.

The collection affords an interesting little Deltoid tooth, which, I believe, has not been heretofore described. Unfortunately, the specimen is quite imperfect, and, although its specific characters permit of description, its generic affinity remains somewhat in doubt.

Description.—Terminal tooth small, subtrigonal in outline, little narrower than long, but slightly inrolled, flattened or gently depressed above; the straight side is abruptly beveled, and from its edge the crown gently inclines to the opposite oblique margin, which is very slightly raised; the border extremity is thickened, forming a well defined continuous marginal border, which rapidly descends upon the inner side and gently slopes into the shallow depressed space in front; toward the terminal extremity

the tooth becomes exceedingly thin, and in the specimen before me the pointed end and outer margin are broken away. The superior surface is coarsely punctate, as is also the straight articular margin. Distance between the angles of the broader extremities .38 inch.

The tooth above described possesses some characters which seem to connect it more closely with *Xystrodus*, Agassiz, (MS.) than with any other genus with which I am acquainted. Its general depressed trituating surface, and but slightly convoluted terminal extremity, are strongly suggestive of this relation. The genus *Xystrodus* was established by Prof. Agassiz, for the reception of *Cochliodus striatus* and two or more other European species from the mountain limestone.

Form. and Loc.—Upper Coal Measures.

DELTODUS? ANGULARIS, N. and W.

Ref.—Newberry and Worthen, Geol. Illinois, Vol. II, p. 97; Pl. IX, Fig. 1.

Description.—Terminal tooth small, obliquely triangular in outline, thick, but slightly inrolled; the broader extremity has a sigmoidal curvature terminating in an acute point at the oblique posterior extremity; straight side forming an angle of about 55° with the oblique margin, abruptly truncated, with a narrow sulcus about the middle of the beveled articular face extending from the inner angle to the pointed end, below which the tooth apparently expands into a thin narrow border similar to that upon the opposite side; the articular margin is bordered by a prominent flattened ridge which occupies about one-third the surface of the crown and gradually narrowing as it approaches the terminal point; a sharp, narrow keel rises from the oblique margin, rapidly converging and decreasing in prominence toward the apical end, and separated from the broad, flattened prominence of the straight margin by an equally broad, deep, angular furrow; along the oblique side the tooth was slightly expanded into a thin marginal border. The crown surface is beautifully granulo-punctate, the broader extremity very faintly marked by longitudinal sigmoid lines of growth, and the broad mesial depression is traversed by very obscure undulations parallel with the oblique keel. Under surface longitudinally undulated, smooth.

Length of tooth along the straight margin, about .52 inch.; greatest distance between the acute and obtuse angles of the broader extremity, .48 inch.

The collection affords but a single example of this handsome form. The specimen before me has a remarkable resemblance to the posterior teeth of *Deltoptychius* Agassiz (MS.), founded upon Cochliodus acutus, of the Irish mountain limestone, but we do not at present possess the materials fully to demonstrate this identity. The Nebraska tooth, however, is evidently identical with the form described by Messrs. Newberry and Worthen, from stratigraphically corresponding horizons in Illinois; and Dr. White has discovered the same, or a very closely allied species, in the Upper Coal Measures of southwestern Iowa.

Form. and Loc.—Upper Coal Measures.